

EXHIBIT C

MSDS Number: T7112 ***** Effective Date: 01/31/03 ***** Supersedes: 11/02/01

MSDS

Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08866

Mallinckrodt
CHEMICALS
J.T. Baker

24 Hour Emergency Telephone: 800-859-2151
CHEMTREC: 1-800-424-9300

National Response to Chemical
CANUTED: 612-695-4615

Outside U.S. and Canada
Chemtrec: 781-427-0887

NOTE: CHEMTREC, CANUTED and National
Response Center emergency numbers to be
used only in the event of chemical emergencies
involving a spill, leak, fire, explosion or accident
involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

TRIS HYDROCHLORIDE

1. Product Identification

Synonyms: 2-Amino-2-(hydroxymethyl)-1,3-propanediol, hydrochloride; Tris HCl; Tris (hydroxymethyl) aminomethane Hydrochloride

CAS No.: 1185-53-1

Molecular Weight: 157.59

Chemical Formula: C₄H₁₁NO₃ClH

Product Codes:

J.T. Baker: 1501, 4103, 4106, 4108

Mallinckrodt: H590

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Tris Hydrochloride	1185-53-1	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate

Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

Potential Health Effects

Inhalation:

May cause irritation to the respiratory tract. Symptoms may include coughing and shortness of breath.

Ingestion:

Mild alkali. May cause irritation and reddening to the mucous membranes of the mouth, esophagus, and gastrointestinal tract. Large oral doses may cause weakness, collapse, and coma.

Skin Contact:

May cause irritation with redness and pain.

Eye Contact:

May cause irritation, redness, pain, and corneal damage.

Chronic Exposure:

Chronic dermatitis may follow skin contact.

Aggravation of Pre-existing Conditions:

No information found.

4. First Aid Measures

Inhalation:

Remove to fresh air. Get medical attention for any breathing difficulty.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes.

Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally.

Get medical attention if irritation persists.

5. Fire Fighting Measures

Fire:

As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.

Slight fire hazard when exposed to heat or flame.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

Water spray, dry chemical, alcohol foam, or carbon dioxide.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage and moisture. Separate from incompatibilities. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

None established.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear protective gloves and clean body-covering clothing.

Eye Protection:

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Transparent, colorless crystals.

Odor:

Odorless.

Solubility:

Soluble in water.

Density:

No information found.

pH:

No information found.

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

Not applicable.
Melting Point:
 150 - 151C (302 - 304F)
Vapor Density (Air=1):
 No information found.
Vapor Pressure (mm Hg):
 No information found.
Evaporation Rate (BuAc=1):
 No information found.

10. Stability and Reactivity

Stability:
 Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
 Burning may produce carbon monoxide, carbon dioxide, nitrogen oxides.
Hazardous Polymerization:
 Will not occur.
Incompatibilities:
 Copper, brass, aluminum, and oxidizing agents.
Conditions to Avoid:
 Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Tris Hydrochloride (1185-53-1)	No	No	None

12. Ecological Information

Environmental Fate:
 No information found.
Environmental Toxicity:
 No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----
Ingredient TSCA EC Japan Australia

Tris Hydrochloride (1185-53-1) Yes Yes No Yes

-----\Chemical Inventory Status - Part 2\-----
Ingredient --Canada--
Korea DSL NDSL Phil.

Tris Hydrochloride (1185-53-1) No Yes No Yes

-----\Federal, State & International Regulations - Part 1\-----
-SARA 302- -SARA 313-
Ingredient RQ TPO List Chemical Catg.

Tris Hydrochloride (1185-53-1) No No No No

-----\Federal, State & International Regulations - Part 2\-----
Ingredient CERCLA -RCRA- -TSCA-
261.33 8(d)

Tris Hydrochloride (1185-53-1) No No No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: None allocated.

Poison Schedule: None allocated.

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 1 Flammability: 1 Reactivity: 0

Label Hazard Warning:

WARNING! HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

Label Precautions:

Avoid contact with eyes, skin and clothing.

Avoid breathing dust.

Keep container closed.

Use with adequate ventilation.

Wash thoroughly after handling.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention. If inhaled, remove to fresh air. Get medical attention for any breathing difficulty. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists.

Product Use:

TRIS AUG. 9. 2004 6:53PM

BROWDY AND NEIMARK

NO. 5732 P. 42
<http://www.jtbaker.com/msds/englishhtml/t7112.htm>

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 3, 7.

Disclaimer:

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